SERVICES IN THE U.S. BALANCE OF PAYMENTS 1982-1984: DOCUMENTATION OF OTA ESTIMATES

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INTRODUCTION

This paper documents the procedures and assumptions used to prepare OTA's estimates of the impacts of services trade on the Nation's balance of payments as published in the OTA Special Report Trade in Services: Export and Foreign Revenues. OTA's estimates were compiled using the best available data from sources including:

- reports and surveys of the Department of Commerce -- i.e. the Bureau of Economic Analysis (BEA), the Census Bureau, the International Trade Administration, the Travel and Tourism Administration, and the National Telecommunications and Information Administration;
- BEA's inbound and outbound surveys of foreign direct investment (FDI);
- reports and surveys by other Government agencies -- i.e. the Federal Reserve Board, the Departments of Transportation, Education, Labor, and Treasury, the International Trade Commission, the Federal Communications Commission;
- company annual reports and 10-K data reported to the Securities and Exchange Commission;
- previous assessments of the Office of Technology Assessment.
- reports and articles in the general and business press (e.g., Wall Street Journal, Financial Times, The Economist, Business Week, Fortune, Forbes), as well as the specialized trade press;
- other private-sector surveys and publications -- e.g., by trade associations;
- interviews with people having knowledge and expertise concerning the industry in question, including Commerce Department and other Government officials, private sector and trade association representatives, independent consultants, and academics.

For each sector, the data judged most reliable were used to construct an estimate of the value of U.S. service exports and imports, as well as sales through foreign affiliates, for the period 1982-1984. OTA relied exclusively on the official U.S. balance of payments data only for those sectors (most notably licensing and transportation) where no alternative sources of information were available. In those cases where no precise estimate was possible, OTA presents a range that reflects the degree of uncertainty.

The remainder of this paper is a detailed discussion of the data sources, adjustments and underlying assumptions utilized in constructing OTA's balance of payments and foreign revenue estimates for each service sector.

ACCOUNTING

The estimates for direct exports are based on partial data in the BEA outbound benchmark survey of foreign direct investment (FDI)(reference 75). Six U.S. parent firms were reported in the 1982 survey, with total sales of nearly $3.4 billion. These six firms had service exports of less than $200 million, including sales to foreign affiliates. This is used as the lower bound estimate. Total U.S. sales of the Big Eight in 1982 were roughly $5.3 billion according to Public Accounting Report (reference 55); therefore the six parent firms accounted for about 64 percent of Big Eight sales (and most if not all of these six must therefore be Big Eight firms). If they accounted for a similar share of Big Eight exports, total Big Eight service exports would be at most about $300 million. Given the dominance of the Big Eight in the U.S. export market, it therefore seems safe to assume that industry exports were at most $0.5 billion.

The totals for foreign affiliate sales include not only those reported in the FDI surveys but also the non-U.S. sales receipts of U.S. firms' foreign networks (even though the foreign firms in these networks are not "foreign affiliates" in the strict legal sense of the term). The lower bound represents revenues of the foreign networks of the Big Eight firms as reported in Public Accounting Report (reference 55). The upper bound includes not only the Big Eight but those second tier U.S. firms with foreign networks as indicated in International Accounting Bulletin (reference 35). Only those firms whose worldwide network earned more than 50 percent of total revenues in the United States are treated as U.S. firms with foreign networks. (Those whose networks earned less than 50 percent of worldwide revenues through their U.S. operations were defined as foreign firms with U.S. networks, and are included in the totals for U.S. revenues of foreign firms as described below.)

Data on direct imports are not available but all analysts conferred with agreed that the total is negligible, as most foreign accounting firms operate through their affiliations with the Big Eight U.S. firms.

For U.S. affiliates of foreign firms, the total presented includes all major firms listed in International Accounting Bulletin (reference 35) whose worldwide networks earned less than 50 percent of total revenues in the U.S. market. The figures presented reflect the total U.S. sales of those networks.

ADVERTISING

For direct exports, the lower bound is based on data reported by U.S. advertising parent firms in the BEA direct investment surveys (references 75 and

76) . The upper bound is based on the difference between the total reported for affiliates in the BEA surveys and the total foreign revenues reported in the annual surveys of Advertising Age (references 95, 96 and ^7). The figures used from Advertising Age exclude those subsidiaries which are double-counted in the annual survey. Thus, the upper bound assumption is that any revenues appearing in the Advertising Age survey but not in the FDI survey represent direct export earnings. The lower bound assumption is that none of these excess revenues represent export earnings (i.e. they were affiliate sales).

For direct imports, conversations with industry experts indicate that the total is negligible.

For both foreign firms' U.S. affiliates and U.S. firms' foreign affiliates, data are from the BEA FDI surveys for 1982 and 1983 (references 30, 31, 75 and 76, respectively).

BANKING

For foreign revenues of U.S. banks, 1984 data are as reported in unpublished Federal Reserve Board data from schedule RI-D, Quarterly Report of Condition and Income (reference 56). Data on international operations in these reports are estimated by the reporting banks. The survey includes all banks for which international operations account for more than 10 percent of total revenues, total assets or net income.

For 1982 and 1983, data on U.S. banks' foreign revenues are from the Federal Reserve System as presented in the Annual Statistical Digest (references 89, 90) . For non-interest income, it is not possible to allocate the total between domestic and foreign offices because IBFs (International Banking Facilities) were included in the totals for foreign offices prior to 1984.

The Federal Reserve data include only those affiliates owned or controlled at the 25 percent equity level or greater. Data from the 1982 benchmark outbound direct investment survey (reference 75) include all affiliates (i.e. at the 10 percent equity level or greater). However, the data in this survey present total income, which cannot be disaggregated into interest and non-interest components. Also, net interest income cannot be reliably estimated from the total income figures (which includes gross interest income and non-interest income).

For foreign banks' U.S. operations, no comprehensive revenue data are available. The data for net interest income booked in foreign (non-U.S.) banks are estimates based on Treasury data on U.S. liabilities to foreigners (reference 74) and assuming a typical range of yields on those liabilities as follows:

	1981	1982	1983	1984
a. Year-end bank liabilities to unaffiliated foreign banks, payable in US dollars (in millions):	26730(est)	50230	60236	74794
b. Bank liabilities to foreigners, payable in foreign currencies (in millions):	3523	4844	5219	7542
c. US nonbank foreign financial liabilities (in millions):	12157	11066	10441	13951
d. Sum of a-c:	42410	66140	75896	96287
e. Est average balance for year (in millions):		54275	71018	86092
f. Revenue (assuming 5% net on average balance (in billions):		$2.7	$3.6	$4.3
g. Revenue (assuming 2% net on average balance (in billions):		$1.1	$1.4	$1.7

The above represent U.S. interest payments on liabilities booked in foreign offices. For U.S. offices of foreign banks, data on receipts are not available. Using Federal Reserve data on asset levels and U.S. banking industry averages for yields, receipts can be estimated as follows:

	1981	1982	1983	1984
Assets at year-end (in billions):	$251.218	301.022	333.336	378.314
Estimated average balance assets (in billions):		$276.1	317.2	355.8
US banking industry averages:				
net interest income/assets:		.0317	.0315	.0316
non-interest income/assets:		.0105	.0112	.0127
Implied net int. income (upper bound):		$8.8B	$10.0B	$11.2B
Implied non-int. income (upper bound):		$2.9B	$3.6B	$4.5B
Estimated share of above representing U.S. business:		25%	25%	25%
Modified net interest income (upper bound):		$6.6B	$7.5B	$8.4B
Modified non-interest income (upper bound):		$2.2B	$2.7B	$3.4B
Total upper bound estimate:		$8.8B	$10.2B	$11.8B

Given the clear uncertainties of the above method, particularly for non-interest income, it is probably only safe to conclude that 1) it is not possible to estimate non-interest income with great accuracy and 2) given the above, non-interest income could easily have been in the range of $2 billion annually over the study period.

The lower bound on foreign banks' U.S. office income was calculated based on an examination of annual report data. The largest foreign owned U.S. bank holding companies (7 among the top 100 U.S. banks in 1982 and 1983, 8 in 1984) had U.S. revenues (defined as the sum of net interest income and non-interest income) of $2.6 billion in 1982, $2.9 billion in 1983, and $3.6 billion in 1984. These figures fail to include branches, agencies, and the smaller subsidiaries and affiliates. A "low profitability" assumption for U.S. branches, agencies, etc. is that the U.S. offices of foreign banks were only as profitable (in terms of income/asset ratios) as were the foreign offices of US banks. Thus:

	1982	1983	1984
	(in billions)		
Estimated average balance assets of US offices of foreign banks excluding subsidiaries:	$193.6	222.1	252.7
U.S. earning assets (assuming 15% non-earning and 25% were non-US business):	123.4	141.6	161.1
Net interest plus non-interest income for US bank foreign offices	0.59%	0.49%	NA
Applying this rate to US offices of foreign banks:	0.7	0.7	0.8-0.9 (est)
Adding in subsidiary estimates from above to yield total lower bound estimate:	3.3	3.6	4.4

Banking balance of payments data were provided by BEA from unpublished data under the condition that they not be presented separately from other items in the "Other receipts and payments" category of the official U.S. balance of payments. These estimates could not be verified independently.

CONSTRUCTION

Direct exports estimates for 1982 and 1983 reflect figures from an industry-sponsored survey conducted by Price Waterhouse (reference 18). Aggregate results of this study were as follows:

	1982	1983
total direct exports:	$21.738 billion	$19.572 billion
direct exports net of foreign expenses:	5.606	4.775

The direct export figure for 1984 is a crude range estimate based on 1982 and 1983 survey results.

For sales by foreign affiliates of U.S. firms, data are from the BEA's direct investment surveys (references 75 and 76). The estimates of revenues net of subcontracting are based on the ratio of repatriated to total revenues from the Price Waterhouse study - thus it is assumed that foreign affiliates of U.S. firms subcontracted on foreign work at the same rate as U.S.-based firms did on foreign work.

For direct imports, the firms reporting annual awards data to Engineering News Record (reference 69) are assumed to represent the universe of firms active in the U.S. market. Zero is assumed for a lower bound on direct imports of construction services (i.e. 100 percent of foreign activity in the U.S. is assumed to occur through U.S. affiliates of foreign firms, which are included in the ENR data). For the upper bound, it is assumed that all awards generate direct imports (i.e. none of the ENR data reflects affiliate sales) and that all awards generate receipts in the year of the award. This is an upper bound assumption because awards have been growing over time and revenues are generated by a stream of awards from the past as well as the current year. It is also assumed that subcontracting occurs at the same rate as overall subcontracting in the U.S. market, as indicated in the Census of Construction Industries (reference 91). This is also an upper bound assumption, as Census data is skewed by small firms and individuals which tend to subcontract less of their work on a percentage basis. 1984 direct imports are an estimate based on 1982 and 1983 results.

For sales by U.S. affiliates of foreign firms, data are from the BEA annual inbound direct investment surveys (references 30 and 31). The figure for net construction receipts assumes that the ratio of value added to total receipts was .4676, as reported for the overall U.S. construction industry in the 1982 Census of Construction Industries (reference 91).

Following is an expanded version of the Construction foreign revenues table in the Special Report, showing pre-subcontracting estimates as well as final estimates:

Foreign revenues in construction services (billion dollars)

	1982	1983	1984
Foreign revenues of U.S. firms			
direct exports: total	21.7	19.6	NA
net of foreign expenses:	5.6	4.8	4.0-6.0
affiliate sales: total	13.8	13.4	NA
majority-owned	12.2	11.8	NA
minority-owned	1.6	1.6	NA
net of foreign subcontracting:	3.2-3.6	2.9-3.3	NA
total foreign revenues	8.8-9.2	7.7-8.1	NA

U.S. revenues of foreign firms			
ENR awards data	4.8	3.6	NA
direct imports (net of US sub-contr):	0.0-2.2	0.0-1.7	0.0-2.0
affiliate sales: total	7.5	6.9	NA
net of US sub-contr:	3.5	3.2	NA
total U.S. revenues	3.5-5.7	3.2-4.9	NA

DATA PROCESSING

The 1982 Census of Service Industries (reference 94) turned up only trivial amounts of data processing service exports (at most $280 million and probably less than $100 million -- some respondents indicated exports but did not quantify receipts). The Census figure is used as the lower bound for direct exports since at least that level of activity is firmly established to exist. However, non-dp industry firms are known to have a substantial amount of foreign activity as well. ADAPSO estimated in 1983 that total exports in data processing were $1.2 billion (reference 78). This figure is used as an upper bound, as it apparently includes some activity of foreign affiliates in addition to direct sales from the United States. It was not possible to estimate a growth rate over time given the lack of data.

For sales by foreign affiliates of U.S. firms, the data for 1982 and 1983 are taken from the BEA direct investment surveys (references 75 and 76). Computer and DP foreign affiliates had $1 billion in sales each year. The lower bound estimate for affiliate sales assumes that none of this activity is data processing; the upper bound estimate assumes 80 percent of it is data processing.

For the DP sales of affiliates in other industries, estimates were derived from the direct investment surveys cited above and include other computer services (e.g. software) as well as DP (DP could not be separated). The 1982 outbound FDI survey indicates that computer and DP service sales by industry of sales exceeded computer and DP sales by industry of affiliate by $5.7 billion. As indicated in the SOFTWARE section below, $3.1-3.6 billion of this is assumed to represent the software sales of hardware affiliates. This leaves $2.1-2.6 billion unaccounted for; this is assumed to represent the level of computer service sales by non-hardware and non-software affiliates abroad. For 1983 and 1984 computer service sales by non-software and non-hardware firms are assumed to have grown as rapidly as hardware affiliates' software sales. This yields estimates of $2.3-2.9 billion in 1983 and $2.4-3.1 in 1984. Again, it is

impossible to say how much of this represents DP sales as opposed to software and other computer services. The entire amount is included in the DP section and treated as zero in the software section to avoid double-counting.

No data are available on direct import. U.S. affiliates abroad are known to be a major source of imported DP services. Given the total level of sales as reflected in (2) above, however, it seems safe to say that total U.S. DP imports were not in excess of $2 billion annually; therefore a range of $0-2 billion is employed.

Sales of U.S. affiliates of foreign firms comes from BEA's 1983 inbound FDI survey (reference 30), which included computer and DP services as a new category. This survey reported $0.2 billion total sales, including other computer services as well as DP.

EDUCATION

Tuition payments of foreign students in the United States are calculated as follows:

(number of foreign students)
X (percent in public or private school)
X (public or private average tuition)
X (percent foreign students' funding from non-US sources)
= (tuition payments from foreign sources)

Sources of data are the Digest of Educational Statistics of the U.S. Department of Education (reference 21, for annual costs at public and private schools), and Open Doors, the annual report on International Educational Exchange of the Institute of International Education (reference 49). The percent of funding from non-U.S. sources is based on the breakdown of foreign students by primary source of funds (and thus assumes that all students receive 100 percent of funding from their primary source). The figure for 1984-85 is preliminary based on estimated growth in costs.

For other expenses of foreign students in the United States, it is necessary to estimate the fraction already reflected in the balance of payments through the travel account, as follows:

	1982	1983	1984
Percent foreign trips for study	4%(est)	4%	4%
Total overseas visitors' expenditures	$10.0B	$9.0B	$8.7B
plus Mexico and Canada	15.7	14.1	13.7
Implied ed. $ in travel account	0.40-0.63	0.36-0.56	0.35-0.55
Non-tuition $ of foreign students	1.74-2.33	1.81-2.42	1.91-2.55
Amount missing from travel account	1.11-1.93	1.25-2.06	1.36-2.20
Percent foreign $ foreign sources	84.7%	83.1%	82.3%
Foreign funded amount missing from travel account	$0.94-1.63B	$1.04-1.71B	$1.12-1.81B

The U.S. Travel and Tourism survey of U.S. travelers abroad (references 53 and 54) is the source of data for the percent of foreign trips occurring for the purpose of study and for overseas travel expenditures; data on Canadian and Mexican travel are from BEA (reference 9).

For U.S. students abroad (importing educational services), there are no data yet available for the 1982-1984 period. The range reported for total expenditures is based on 1) 1981 data reported by UNESCO on the number of U.S. students abroad and cited in Open Doors 1984/85 (reference 49); 2) the assumption that the number of U.S. students abroad did not change over 1981-1984 (this is probably a reasonable assumption, as overall U.S. student enrollment was stable over this period); 3) living costs and tuition are assumed to be comparable to U.S. costs, as most U.S. students abroad in this period were studying in Canada or the large industrial countries of Western Europe (also, many students pay their US schools as part of an exchange program instead of paying the foreign school directly). Thus:

Tuition:	LOW	HIGH
number of students	20,000	25,000
tuition	$4000	$5000
% US funded	80%	100%
total US-paid	$64 million	$125 million

Other expenses:	LOW	HIGH
number of students	20,000	25,000
living costs	$5000	$7500
% US funded	80%	100%
total US-paid	$80 million	$188 million

Total costs are therefore estimated at $144-313 million annually. However, from this must be subtracted the amount already appearing in the travel account. The method used above for foreign students in the U.S. is not reliable for U.S. students abroad, as a high percentage of foreign trips for study also involve tourism and leisure travel activity. Thus the lower bound assumption for educational imports assumes that 100 percent of the non-tuition expenditures are already reflected in the travel account, while the upper bound assumes that 0 percent are reflected. Both assume that tuition payments are not reflected in the travel account.

ENGINEERING

For direct exports, the 1982 Census of Service Industries (reference 94) revealed at least $1.4 billion in sales to nonresidents by U.S. firms. Firms indicating non-zero sales to non-residents (but not reporting the level of sales to non-residents) had an additional $1.7 in total sales. Thus, sales to nonresidents could have been as high as $2.9 billion. If these non-reporting firms had the same percentage of total sales to nonresidents as those firms reporting the level of nonresident sales, total nonresident sales (exports) would have been $1.7 billion.

The annual survey of U.S. design firms by Engineering News Record (reference 71) reported $1.38 billion in gross foreign receipts for the largest U.S. firms in 1982, $1.26 billion in 1983, and $1.13 billion in 1984. For total receipts (domestic plus foreign receipts), net receipts were 87.06, 90.03 and 89.90 percent of gross receipts (net-gross ratios broken down into domestic and foreign subcomponents are not available). Assuming that net foreign billings were about 90 percent of gross foreign billings each year, the implication is that net foreign billings were roughly $1.2, $1.1, $1.0 billion in 1982, 1983, and 1984 respectively. This is below the 1982 estimate of $1.7 billion from Census data derived above, even though the ENR data includes some

sales through foreign affiliates as well as direct exports. The 1982 ENR-derived estimate is about 70 percent of the 1982 Census-derived estimate. Thus, an upper bound on direct exports can be calculated by assuming that the ENR data represent 70 percent of the universe of total export activity each year of the 1982-1984 period.

Affiliate sales data are taken from the BEA foreign direct investment surveys (references 30, 31, 75 and 76).

For direct imports, the lower bound estimate is based on U.S. revenue figures of non-U.S. design firms over 1982-1984 as reported in the annual ENR international design firm surveys (reference 70). The upper bound estimate assumes that the firms in the ENR survey had only one-third of the U.S. market for imported design services.

FRANCHISING

Data on direct exports of franchising services are not available. The estimates used were derived from data on the distribution of foreign franchising operations as reported in Franchising in the Economy 1984-1986, a survey by the U.S. Department of Commerce (reference 32). A crude estimate was constructed by assuming that, for eleven types of franchising establishments, sales per establishment for a given type were equal to sales per establishment for that type of establishment in the U.S. market. Franchising earnings were then estimated by assuming that franchise fees were 2 to 5 percent of sales (based on estimate of a Commerce Department industry analyst, reference 39).

For direct imports as well, comprehensive data do not exist. However, the Department of Commerce, Office of Service Industries, indicated that foreign franchising in the U.S. is much less extensive than U.S. franchising abroad (reference 39). Given the relatively low magnitude of the estimate for U.S. fees from foreign franchise operations, fees earned by foreign franchisors in the U.S. market can safely be assumed to be negligible.

HEALTH

Direct exports consist of two components: payments of foreigners journeying to the United States for medical services and earnings abroad by U.S. firms (particularly hospital management firms). Payments by foreigners include medical payments only. Associated travel expenditures are assumed to be captured by the travel and transportation sector estimates. Conversations with

representatives of two major U.S. treatment centers for foreigners (references 47, 61) indicate that 1) only a handful of U.S. centers conduct significant business in this area and 2) the total revenue generated excluding associated travel payments is likely to be less than $100 million annually. This estimate is based on patient totals and per-patient costs reported by these two institutions and the assumption that they account for one-third of U.S. treatment center volume.

Exports from foreign management activity is estimated to be at least $1 billion by the Department of Commerce (reference 60). The upper bound estimate is based on an estimate by the Federation of American Hospitals (reference 27) that 10 percent of U.S. investor-owned hospitals' revenue obtains from foreign activity (affiliate sales as reported in the outbound investment surveys were subtracted from this figure, as some of the earnings result from foreign affiliate operations).

Sales of foreign affiliates are as reported in the direct investment surveys (references 75 and 76).

Direct imports are assumed negligible, excluding the incidental health care expenditures of Americans traveling abroad, which are assumed to be captured by the travel sector estimates. U.S. affiliates of foreign firms were first reported separately for health services in the inbound direct investment surveys of BEA in 1983 (reference 30).

INFORMATION SERVICES

The Information Industry Association estimated in 1983 that $2.6 billion in industry revenues were non-US in origin in 1982 (references 10, 14). Projected growth rates for Europe and other areas combined generate projected total non-U.S. revenues of $2.9 billion for 1983. Using the projected 1983-1987 annual growth rates as an estimate of growth for 1983-84 generates an estimate of $3.1 billion in non-U.S. revenues in 1984. These figures cannot be disaggregated into direct exports as opposed to affiliate sales.

For U.S. revenues of foreign firms no data are available. The estimate utilized ($0-0.5 billion) presumes a healthy U.S. export balance, which most observers agree is currently the situation. The upper bound estimate was verified as an absolute upper limit by the Information Industry Association (reference 50).

INSURANCE

Foreign revenues of U.S. firms consist of three components: reinsurance premiums, life and health insurance premiums, and property and casualty insurance premiums. The figures presented for reinsurance are those presented by the Bureau of Economic Analysis in the balance of payments (reference 59). No other data sources are available and the general consensus is that these figures are a reasonably accurate reflection of reinsurance activity.

The estimates for direct premium receipts in both life/health and property/casualty are those of an analyst of the U.S. Department of Commerce, Office of Service Industries (reference 28). The life/health estimate is based on foreign revenue figures reported by the American Council of Life Insurance (reference 11) and AIG International, the only major direct exporter of life insurance not a member of the Council (reference 86). The estimate given represents the share of foreign revenues assumed to be balance of payments transactions (with the remainder representing income through of foreign affiliates as discussed below).

Estimated sales of U.S. affiliates abroad are derived from the direct investment surveys of the Bureau of Economic Analysis (references 75 and 76). The surveys report total income (interest income as well as premiums). Premium income is estimated as follows:

For 1982, total income of life, accident and health insurance affiliates overseas was $6.358 billion. Total assets were $18.97 billion. Assuming 1) that gross interest income was generated through an average yield on interest-earning assets of 14.5 percent and 2) that 85 to 90 percent of assets were interest-earning, total interest income of affiliates from life, accident and health insurance would be 2.338-2.476 billion, and thus non-interest income would be an estimated $3.9-4.0 billion. For property and casualty affiliates, total reported income was $10.409 billion in 1982; assets were $25.115 billion. Again assuming that 85 to 90 percent of assets were interest-earning and a gross yield of 14.5 percent, interest income would be $3.095-3.278 billion and thus non-interest income would be $7.1-7.3 billion. The conclusion is that total non-interest income was $11.0-11.3 billion. It is assumed that most or all of this income represented premium receipts.

For 1983, total income was $6.749 billion for life and health affiliates and $9.737 billion for property and casualty; assets were $21.786 and $25.277 billion, respectively. Assuming 1) a return on assets of 11% and 2) that 85 to 90 percent of assets were interest-earning, this suggests that total interest income was $2.037-2.157 billion for life and health and $2.363-2.502 billion for property and casualty. Thus non-interest income (assumed to be mostly premium receipts) would be $4.6-4.7 billion for life and health affiliates and $7.2-7.4 billion for property and casualty. The conclusion is that total premium income was an estimated $11.8-12.1 billion.

For 1984, the total would be $12.7-13.0 billion if the same growth rates for 1983-84 applied as for 1982-83.

From the above must be subtracted premium receipts from U.S. business. Insurance income from U.S. customers (both affiliated and unaffiliated customers) was 13.76 percent of total income for majority-owned insurance affiliates in 1982 and 11.77 percent in 1983. Based on unpublished data from the 1982 benchmark survey provided by BEA, the percentages in 1982 were 5.51 percent for life, accident and health insurance, and 19.10 percent for other insurance (property and casualty). Assuming 1) that the same percentage of total income was from U.S. business for minority-owned affiliates as well and 2) that the 1982 percentages applied for the entire 1982-84 period, this would imply premium income from non-U.S. customers as follows:

	total premium income from all customers (in billions)	from U.S. customers (in billions)	from non-U.S. customers (in billions)
1982 life & health	$3.9-4.0	$0.0-0.2	$3.7-4.0
1982 property/casualty	7.1-7.3	0.0-1.4	5.7-7.3
1982 total	11.0-11.3	0.0-1.6	9.4-11.3
1983 life & health	4.6-4.7	0.0-0.3	4.3-4.7
1983 property/casualty	7.2-7.4	0.0-1.4	5.8-7.4
1983 total	11.8-12.1	0.0-1.7	10.1-12.1
1984 life & health	5.4-5.5	0.0-0.3	5.1-5.5
1984 property/casualty	7.3-7.5	0.0-1.4	5.9-7.5
1984 total	12.7-13.0	0.0-1.7	11.0-13.0

In each case the lower bound on U.S.-customer business is zero (because it may be that all reported income from U.S. customers is actually interest income from investments -- i.e. U.S. premiums are zero). The upper bound on U.S. earnings assumes that the ratio of US-customer income to total income equals the ratio of US-customer premiums to total premiums (premium data are taken from references 84 and 83 for life/health and property/casualty, respectively).

In calculating the balance of payments impact of insurance, not only premiums but also claims must be considered. For reinsurance claims paid by U.S. firms, BEA-reported data are utilized (reference 59). For direct life/health and property/casualty claims paid, the loss ratios (ratio of claims paid to premiums received) for reinsurance is assumed to apply for direct insurance as well.

For foreign firms operating in the U.S. market, direct insurance activity in life and health is negligible. For property and casualty, directly imported foreign insurance in the U.S. market is predominantly attributable to Lloyd's of London. Based on an estimate that Lloyd's insures 2 percent of U.S. liability (reference 43) and assuming Lloyd's therefore had 2 percent of U.S. premiums, premium income would be $2.4 billion in 1984, $2.2 billion in 1983, and $2.1 billion in 1982 (based on U.S. premium data reported by the Insurance Information Institute in reference 83).

Data for the U.S. affiliates of foreign firms are estimated in similar fashion to the foreign affiliates of U.S. firms as presented above. In 1983, the BEA annual survey of FDI in the U.S. (reference 30) reports total income of U.S. insurance affiliates of foreign firms to be $21.677 billion ($11.765 life, the rest non-life including health). Total assets were $51.814 billion ($31.185 life). Assuming 1) 85 to 90 percent of assets were interest-earning and 2) typical gross yield of 11.5 percent, this implies gross interest income of $3.05-3.23 billion for life insurance affiliates and $2.02-2.14 billion for other insurance affiliates. Premium income (total income net of interest income) is thus assumed to have been $8.54-8.72 billion for life affiliates and $7.77-7.89 billion for other insurance affiliates, and thus $16.3-16.5 billion total.

A second approach to estimating premium receipts of U.S. affiliates was also employed. If premium-to-asset ratios of the U.S. life insurance industry in 1983 (0.182; calculated from reference 84) and the U.S. property/casualty industry (0.437; calculated from reference 83) in 1983 applied to these affiliates, premiums would be $5.68 billion (life excluding health), $9.02 billion (other including health), and $14.7 billion (total), respectively. Combining these two approaches suggests that total premium receipts of foreign firms were $14.7-16.5 billion in 1983. This assumes that 100 percent of premium income was from U.S. customers; data on geographic distribution of affiliate receipts are not available.

For 1982, total U.S. affiliate income reported by BEA was $23.603 billion (reference 31); total assets were $48.089 billion. No data on the distribution between life and non-life companies is available for 1982. Assuming a premium-to-asset ratio of between 0.20 (average for all U.S. life companies in 1982; reference 84) and 0.44 (average for all U.S. property and casualty companies in 1982; reference 83) for these affiliates yields an estimated $9.6-21.2 billion in premiums. Assuming a typical yield on assets of 13.5 percent and that 85 to 90 percent of assets were interest-earning, gross interest income would be $5.5-5.8 billion; this implies that non-interest income was $17.8-18.1 billion, of which premiums were the predominant item, or within the range of the premium-to-asset ratio estimate above. Thus, U.S. premium receipts of affiliates of foreign firms in 1982 were $16.9-19.0 billion (derived by taking the midpoint of $17.8-18.1 billion and expanding the range of the estimate so that the error term is equal on a percentage basis to the error term implicit in the estimate for 1983 above).

No data are yet available for 1984. The above results for 1982-1983 suggest that foreign firms' market share was about 10.9 to 12.3 percent of the combined life/health and property/casualty market in 1982 ($154.8 billion; references 84 and 83) and 9.2 to 10.4 percent in 1983 ($159.2 billion; references 84 and 83). Assuming a range of 9 to 12 percent of the combined market for 1984 ($169.4 billion) would imply $15.2-20.3 billion in premium receipts.

INVESTMENT BANKING AND BROKERAGE SERVICES

The estimate for direct exports is based on the outbound surveys of foreign direct investment of the U.S. Department of Commerce (references 75 and 76). Parent firms in the non-bank financial services category exported $0.5 billion in services in 1982 and in excess of $0.9 billion in 1983. These surveys also contain data on the level of assets of these firms. An examination of the annual report and 10K information of leading investment banks in the United States indicates that the group of parent firms in the surveys represented about half the assets controlled by major U.S. investment banks. Thus, the direct export estimates for 1982 and 1983 assume as a lower bound that the parent firms accounted for all service exports, and as an upper bound that these firms accounted for only half of all exports. The upper bound on the 1982 estimate was increased further so that the range between upper and lower bound estimates was $1.0 billion instead of $0.5 billion, as the former was felt to be a better indicator of the level of uncertainty. The direct export estimate for 1984 assumes no growth from 1983 as the lower bound, and a continuation of the estimated growth from 1982-1983 as the upper bound.

A second crude estimate of the level of exports was made by examining the data base on investment banking transactions published periodically by Euromoney, (reference 25) as well as estimates of associated fees gathered from a variety of sources (including references 19, 20, 25, and 36). While this method was not sufficiently precise to produce an independent estimate, it did indicate reasonable order-of-magnitude accuracy for the above estimates.

Foreign affiliates' sales are based on the direct investment surveys (references 75, 76) and include all non-bank financial firms rather than just investment banking and brokerage. No further disaggregation of the data was possible.

The estimate for direct imports by foreign firms is based on foreign firm activity in the U.S. market as reflected in the Euromoney surveys (reference 25).

For U.S. affiliates of foreign firms, data are from the inbound direct investment surveys of BEA (references 30, 31).

The above descriptions of trade on an ownership basis do not reflect the full impact on the U.S. balance of payments because foreign affiliates of U.S. firms sell services back to the U.S. in non-negligible amounts, and U.S. affiliates of foreign firms also export services (to their parents abroad or to other firms and individuals). The estimates for these activities as discussed in the balance of payments section of the text are based on data in the direct investment surveys (both inbound and outbound) as cited above. The outbound

surveys provide data on sales to the United States by foreign affiliates; the inbound surveys only provide data on total sales. Exports by U.S. affiliates were estimated by assuming that U.S. affiliates of foreign firms exported (i.e. sold to non-U.S. customers) as a percentage of their total sales roughly the same amount that foreign affiliates of U.S. firms imported (i.e. sold to U.S. customers) as a percentage of their total sales.

LEASING

For computer leasing, the Computer Dealers and Lessors Association (reference 7) estimated that the world computer leasing market was $1.5-2.0 billion for 1985. The U.S. share is 25 to 30 percent (i.e., $0.4-0.6 billion). If 10 percent annual growth were assumed over the 1980's this would imply roughly $0.3-0.5 billion annually over 1982-1984.

For financial leasing of equipment, the Commerce Department's Competitive Assessment of the equipment leasing industry (reference 13) estimated that the United States leased $8-10 billion in 1983 (combined cross border and indirect leasing). If this were all financial leasing at a rate of 14% gross and 4% net interest, the revenue generated (net of the cost of money) would be $0.3-0.5 billion. This is an upper bound on total financial leasing estimate, as some of the $8-10 billion is operating leasing (estimated independently below). It is also an upper limit because some leases are multi-year and the volume of leasing activity has been growing over time (in other words, the share of the estimate that will be received in future years probably exceeds the currently realized revenues from past lease agreements). An examination of annual report data for the twenty largest U.S. bank holding companies in 1984 (who are reportedly the largest actors in the cross-border leasing market) indicates that a reasonable lower bound estimate would be perhaps $0.3 billion (assuming on average 20% of leases were cross-border and typical net yield of 4%).

For operating leasing of equipment, the 1982 Census of Service Industries (reference 94) indicated that direct export earnings for equipment leasing were in the range of $0.2-0.3 billion (allowing for those establishments which indicated some foreign activity but did not provide a breakdown of receipts into domestic vs. foreign). The BEA direct investment surveys (reference 75) indicate $2.7 billion sales through foreign affiliates for leasing service in 1982 (categorized by industry of sales, not industry of affiliate, so as to capture leasing revenues of affiliates categorized in other industries). Receipts from all sources for affiliates whose primary business was leasing were $3.3 billion in 1982 and $2.8 billion in 1983; sales to the U.S. were negligible.

Auto leasing and rental activity abroad is assumed to occur essentially 100% through foreign affiliates. The BEA direct investment surveys (references

75 and 76) indicate that auto leasing affiliates had sales of $0.9 billion in 1982 and 1983.

Combining all the above:

Foreign revenues in leasing (in billions):	1982	1983	1984
computers	$0.3-0.5	0.3-0.5	0.3-0.5
equipment (finance)	0.3-0.4	0.3-0.4	0.3-0.4
equipment (operating)	2.9-3.6	3.0-3.7	3.1-3.8
auto	0.9-1.0	0.9-1.0	0.9-1.0
total	4.4-5.5	4.5-5.6	4.6-5.7
cross-border subtotal	0.2-1.2	0.2-1.2	0.2-1.2
indirect subtotal	$3.6-5.3	3.7-5.4	3.8-5.5

For foreign firms operating in the United States, U.S. equipment leasing affiliates in the BEA direct investment survey (reference 30) indicated $200 million in 1983 excluding autos and computers. Autos were zero and computers negligible. This was a new category in the 1983 survey, so an equal amount is assumed for 1982. Based on an examination of annual report data for the largest foreign-owned U.S. banks, it seems likely that all foreign-owned banks combined did not account for more than $0.1 billion annually in leasing receipts (net of the cost of money on financial leasing). Therefore, total foreign leasing through affiliates in the United States is estimated at $200-300 million annually. It is not possible to estimate growth over time.

Data on foreign direct leasing to the United States do not exist. Given the level of outbound direct leasing activity and the level of foreign leasing occurring in the United States through affiliates, it is almost certainly safe to say that total direct imports of leasing services do not exceed $1 billion annually (again net of the cost of money on iinancial leases), but there is no basis for further refining the estimate or estimating growth over time.

LEGAL

Data for direct exports are not available. An analyst with the U.S. Department of Commerce's Office of Service Industries (reference 42) estimated that less than 5 percent of industry receipts are generated from foreign activity. This suggests $2 billion annually as a reasonable upper limit on legal service exports. This figure was somewhat higher than that implied by a working draft on trade in legal services prepared for the American Bar Association (reference 17). It was not possible to estimate a lower bound or growth rates over time; therefore a range of $0-2 billion annually is assumed.

For foreign affiliate sales, data are as reported in the 1982 and 1983 outbound FDI surveys (references 75 and 76).

For direct imports, no data are available. The range presented is an OTA estimate based on the general consensus that the United States is a substantial net exporter of legal services.

Fc sales by U.S. affiliates of foreign firms, data are as reported in the 1982 and 1983 inbound FDI surveys (references 30 and 31).

LICENSING

All data on licensing are BEA figures (references 59 and 75). The affiliated outbound receipts figures for 1983 and 1984 are actually net figures (receipts from foreign affiliates net of payments to affiliates). However, the 1982 benchmark survey of U.S. direct foreign investment (reference 75) showed that the difference between net and gross licensing receipts for affiliated outbound activity is negligible (i.e. payments to foreign affiliates by U.S. parents were quite small relative to receipts by U.S. parents from foreign affiliates). This is assumed to be true for 1983 and 1984 as well (gross figures were not available from BEA at the time these estimates were prepared).

MANAGEMENT, CONSULTING AND PUBLIC RELATIONS

For direct exports, the 1982 Census of Service Industries (reference 94) reported $0.5 billion in service exports by management, consulting and PR establishments which reported separately their nonresident sales. This is an absolute lower bound on direct exports for two reasons: some firms did not report sales to nonresidents separately, and firms categorized in other industries were not required to respond. If establishments not reporting dollar levels but indicating that they had nonresident sales had realized all their revenues from nonresidents, nonresident sales would have been an additional $0.6 billion. $1.1 billion is an absolute upper bound since some of the sales of the latter group were to domestic customers. Thus, a range of $0.5-1.1 billion is assumed for 1982 direct exports.

Domestic growth in the industry was 20 percent from 1982 to 1983 and 12 percent from 1983 to 1984. The direct export estimates for 1983 and 1984 assume growth rates of 25 and 15 percent respectively from the 1982 mid-range estimate (i.e. more rapid than domestic growth) for the upper bound and 15 and 10 percent respectively (i.e. less rapid than domestic growth) for the lower bound.

For sales by the foreign affiliates of U.S. firms, BEA direct investment survey data are used for 1982 and 1983 (references 75 and 76). Sales to the U.S. of $0.6 billion in 1982 and 1983 were netted out of total sales of $1.8 billion each year. Sales by minority-owned affiliates were negligible each year.

For direct imports, no data are available. A range of $0.0-0.5 billion annually is assumed, based on the assumption that the U.S. has a positive balance of trade in consulting services among unaffiliated parties.

For sales by the U.S. affiliates of foreign firms, BEA direct investment survey data is utilized (reference 30). This industry group became a separate category in 1983.

The overall impact on the balance of payments includes not only the direct imports and exports estimates as described in (1) and (3) above, but also imports from U.S. affiliates abroad as described in (2) above. BEA direct investment surveys indicate that this amounted to $0.6 billion in each of 1982 and 83 (references 75 and 76).

MOTION PICTURES

For both foreign affiliates of U.S. firms and U.S. affiliates of foreign firms, the data are from the BEA FDI surveys for 1982 and 1983 (references 30, 31, 75 and 76).

The figure for direct exports represents the estimate of the Motion Picture Association of America (reference 4). U.S. production expenditures for foreign films produced in the United States are assumed negligible.

For direct imports, the lower bound reflects BEA balance of payments figure on film rentals. The upper bound includes an estimate for overseas payments by U.S. film producers operating overseas. The estimate is derived by taking the average U.S. production cost per film as reported by the Motion Picture Association of America ($11.8 million in 1982, $14.4 million in 1983, and $16.8 million in 1984; reference 4), multiplied by the number of foreign film starts per year (111 in 1982, 108 in 1983, 151 in 1984; references 82 and 85). The resulting estimate is an absolute upper bound for 2 reasons: 1) a relatively higher percentage of foreign film starts are by independent as opposed to major producers, implying lower budget films and, 2) some of the production costs on foreign-produced films are nevertheless U.S. costs.

SOFTWARE

Direct exports are the sum of three independent estimates: software exports of U.S. software firms; software exports of U.S. hardware firms; and software content of exports by U.S. systems integration firms:

For hardware and software firms, ADAPSO data reported by NTIA indicated that total software exports were $2.2 billion in 1983 out of total sales of $9.7 billion (both figures exclude systems integration software) - thus about 23 percent of sales were exports (reference 78). Using the same 23 percent figure and INPUT estimates of the U.S. market in 1982 ($5.9 billion; reference 34) and 1984 ($10.4 billion; reference 34), this would yield estimated direct exports of $1.4 billion in 1982, and $2.4 billion in 1984.

For turnkey systems, INPUT estimated that total sales (domestic and foreign) were $3.6, 4.5, and 5.9 billion over 1982-1984 (reference 34). ADAPSO as reported by NTIA in 1983 estimated that for turnkey systems 15 percent of sales were direct exports (reference 78). Applying this percentage over 1982-1984 and assuming that 40 to 60 percent of system value represented software, this yields estimated software content of turnkey exports of $0.2-0.3 billion in 1982, $0.3-0.4 billion in 1983 and $0.4-0.5 billion in 1984.

Separate estimates were derived for software sales of software firms and software sales of hardware firms for sales of foreign affiliates. Software sales of non-software firms other than hardware firms are included in the DATA PROCESSING section above, as they could not be isolated from DP and other computer service sales in the estimates.

Affiliates in computer and DP services (including software but also DP, facilities management, etc.) had sales of $1 billion in both 1982 and 1983 according to the outbound FDI surveys (references 75 and 76). Sales to the U.S. were negligible each year (5 percent of total services). The estimate used here assumes for a lower bound that only 20 percent of this total represented software. The upper bound assumption is that 100 percent represented software.

For hardware affiliates, the 1982 BEA outbound FDI survey (reference 75) indicated that office equipment sales by industry of affiliate exceeded total sales of office equipment by $3.1 billion. Most of this can safely be assumed to represent software. For all affiliates in the category of non-electric machinery (including hardware affiliates), service sales (including software) were $3.6 billion. Thus a reasonable range estimate is $3.1-3.6 billion for hardware affiliates' software sales. Subtracting an assumed 8.2 percent for sales to the U.S. (based on sales to the U.S. by majority-owned office equipment affiliates in the 1982 FDI survey) the estimate for hardware affiliates' non-US software sales is $2.8-3.3 billion.

For 1983, the detail necessary to calculate a similar estimate is not available. However, non-electric machinery affiliates had sales exceeding total sales of non-electric machinery by $3.6 billion according to the BEA FDI annual survey (reference 76). Assuming again that 8.2 percent were sales to the U.S. and allowing an error margin of plus-or-minus 10 percent generates an estimate for 1983 of $3.0-3.6 billion. Assuming the same growth rate for 1984 as for 1983 on both the lower and upper bounds generates an estimate of $3.2-3.9 billion in 1984 for hardware affiliates' non-U.S. software sales.

No data are available for direct imports. It is generally agreed that the U.S. runs a strong surplus in software trade among unaffiliated parties It is also agreed that the prime source for U.S. software imports are U.S. affiliates abroad, which manufacture a substantial portion of the software ultimately sold in the U.S. domestic market. Foreign affiliates in computer and DP services (including software affiliates) had negligible sales to the U.S. in 1982 and 1983, according to BEA's FDI surveys. Hardware affiliates (office and computing equipment firms) had sales to the U.S. of $1.7 billion in 1982 and $2.2 billion in 1983. There was no basis for further narrowing the estimate, so a range of $0-1.7 billion in 1982 and 0-2.2 billion in 1983 was utilized for direct software imports. Applying the same growth rate to 1984 generated an upper bound of $2.7 billion.

For the U.S. software affiliates of foreign firms, no separate category available in the BEA surveys of inbound direct investment. A separate category for computer and DP service affiliates was added to the inbound FDI survey in 1983 and reported $0.2 billion in total sales (reference 30).

TELECOMMUNICATIONS

For both foreign affiliates in the United States and U.S. affiliates abroad, data are from the 1982 and 1983 FDI surveys of BEA (references 30, 31, 75 and 76).

The direct import and export figures are as appear in the BEA balance of payments data (reference 59). These compare favorably with separate data of the Federal Communications Commission on common carriers (reference 64). The BEA import data also includes payments to INTELSAT for leasing of satellite channels.

TRANSPORT

The data on direct imports and exports are as reported by BEA in various issues of the Survey of Current Business (reference 79). All data are as they appear in the official BEA current account with two exceptions: 1) inland freight receipts and payments between the United States and Canada have been added (the current account includes this item in the Merchandise portion); 2) passenger fares are included in the transportation totals (the current account treats passenger fares as a separate item). All passenger fares data are as reported in the Survey of Current Business quarterly summaries cited above.

Affiliate sales data are from the BEA direct investment surveys (references 30,31, 75 and 76). Outbound affiliate sales data (U.S. affiliates abroad) are by industry of sales, and thus include transportation service receipts of non-transportation affiliates. Inbound data represent receipts of transportation affiliates.

TRAVEL

Estimates for Canada and Mexico (both receipts and payments) are BEA data (reference 9). Canadian data are estimates of Statistics Canada as cited by BEA. Overseas estimates for 1983 and 1984 (both receipts and payments) were derived as follows:

Average expenditure per visitor ($/visit):	1982	1983	1984
U.S. travelers overseas	NA	989	862
Foreign travelers to the U.S.	NA	1143	1155
Number of overseas visitors (thousand persons):			
U.S. travelers overseas	8510	10179	12062
Foreign travelers to the U.S.	8761	7873	7535
Estimated total expenditures (million dollars):			
U.S. travelers overseas	NA	10067	10397
Foreign travelers to the U.S.	NA	8999	8703

Average expenditures data are from the annual U.S. Travel and Tourism Administration surveys of air travelers (references 51, 52, 53 and 54). Data on the number of travelers annually are from BEA (reference 9). The overseas estimates for 1982 (both payments and receipts) are based on the average 1983 expenditures reported by USTTA (the USTTA survey began in 1983). No adjustment was made for inflation.

The geographic distribution of travel payments and receipts for overseas travel is based on the following distribution of travelers as reported in the USTTA surveys. U.S. travelers' data represents primary destination of trip in the case of multi-area trips:

	Residence of foreign visitors		Destination of US travelers overseas	
	1983	1984	1983	1984
Europe	38%	39%	46%	50%
Caribbean	6	9	15	25
South America	14	11	10	6
Central America	4	4	3	3
Africa	1	2	2	2
Oceania	5	5	5	3
Far East	27	26	21	15
(Japan)	(21)	(18)	(11)	(7)
Middle East	5	5	5	5
total	100%	100%	107%	109%

No geographic distribution is available available for 1982 (the USTTA surveys began in 1983). In all cases average expenditures by visitors from each region and U.S. travelers to each region were assumed to be equal to the average for all visitors as reported by USTTA. The destinations of US travelers sum to over 100 percent in both 1983 and 1984 due to multi-region travel. In allocating imports among regions the percentage breakdown for US travelers overseas was pro-rated to 100 percent.

MISCELLANEOUS SERVICES

The direct export and import figures cited for miscellaneous services include all items in the BEA data (reference 59) not included elsewhere in this study. The export total includes affiliated and unaffiliated fees (excluding royalties and license fees included in LICENSING), U.S. expenditures of foreign governments and international organizations, receipts from Canadian affiliate trade unions, miscellaneous commissions, wages of U.S. residents abroad, expenditures of temporary resident aliens, and other private miscellaneous services. The total for direct imports includes fees (excluding royalties and license fees), payments to Canadian affiliate trade unions, wages of temporary resident aliens, expenditures of U.S. residents abroad, and other private miscellaneous services.

The figures for affiliate sales are from the BEA FDI surveys (references 30, 31, 75, and 76) and include several miscellaneous service categories: lodging; agricultural services; metal mining services; research and development and testing laboratories; employment agencies and temporary help supply services; and other services provided on a commercial basis.

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